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EXAMINER
HAN, CLEMENCE S

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2464	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02/16/2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-14,16-25 and 29-33* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-14,16-25 and 29-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 22 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claim recites "A computer program embodied in a computer readable storage medium" After close inspection, the examiner respectfully notes that the disclosure, as a whole, does not specifically identify what may be included as a computer readable storage medium and what is not to be included as a computer readable storage medium. An examiner is obliged to give claims their broadest reasonable interpretation consistent with the specification during examination. The broadest reasonable interpretation of a claim drawn to a computer readable storage medium (also called machine readable medium and other such variations) typically covers forms of non-transitory tangible media and transitory propagating signals *per se* in view of the ordinary and customary meaning of computer readable media, particularly when the specification is silent. See MPEP 2111.01. When the broadest reasonable interpretation of a claim covers a signal, *per se*, the claim must be rejected under 35 U.S.C. § 101 as covering non-statutory subject matter. Therefore, given the silence of the disclosure and the broadest reasonable interpretation, the computer readable storage medium of the claim may include transitory propagating signals. As a result, the claim pertains to non-statutory subject matter.

However, the Examiner respectfully submits a claim drawn to such a computer

readable storage medium that covers both transitory and non-transitory embodiments

may be amended to narrow the claim to cover only statutory embodiments to avoid a

rejection under 35 U.S.C. § 101 by adding the limitation "non-transitory" to the claim.

Such an amendment would typically not raise the issue of new matter, even when the

specification is silent because the broadest reasonable interpretation relies on the

ordinary and customary meaning that includes signals *per se*. For additional

information, please see the Patents' Official Gazette notice published February 23, 2010

(1351 OG 212).

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3.   Claims 1, 3-14, 16-25, 29 and 31-33 are rejected under 35 U.S.C. 102(e) as

being anticipated by Brown et al. (US 7,046,687).

Regarding claim 1, 11, 22 and 23, Brown teaches a method of allocating queues

in a network device, the method comprising: receiving a packet at an ingress port 1102

of a network device, wherein the ingress port has a plurality of virtual queues 1110

(Column 22 Line 31-45); making a classification for the packet according to a virtual

queue from said plurality of virtual queues (Brown teaches classifying based on

destination port address and priority level in Column 24 Line 1-19, also see Figure 11B),

the virtual queue 1110 configured to hold a collection of information in a particular order,

including information associated with the packet (Column 22 Line 31-45); determining,

by searching a memory of allocated physical queues, whether a previously- allocated

physical queue exists for the classification ("locates an entry .. that has the same

destination address and priority level" in Column 36 Line 52-55, see also step 1802 in

Figure 18); allocating a physical queue for the classification when no previously-

allocated physical queue exists for the classification ("If there is no entry, i.e., no active

VOQ, with the same destination address ... creates a new entry" in Column 36 Line 57-

61, see also step 1802 in Figure 18); associating the physical queue with the ingress

port (iVOQs 1110 is associated with iReveiver 1102, see Figure 11A); storing said

information associated with the packet in the allocated physical queue (step 1802-step

1806); and scheduling the packet for transmission between the ingress port and one of

a plurality of egress ports of the network device (Column 23 Line 30-33, see also Figure

19).

Regarding claim 3 and 13, Brown teaches the virtual queue is a virtual output

queue 1110.

Regarding claim 4 and 14, Brown teaches detecting when a previously-allocated

physical queue is empty; and de-allocating the empty previously-allocated physical

queue (Column 36 Line 61-44, also see Column 27 Line 43-46).

Regarding claim 5 and 12, Brown teaches the virtual queue is associated with an ingress port (iVOQs 1110 is associated with iReveiver 1102, see Figure 11A).

Regarding claim 6 and 16, Brown teaches the classification is based on one or more of a packet source, a packet destination, an ingress port number, an egress port number, or a packet priority (Column 24 Line 1-19, also see Figure 11B).

Regarding claim 7 and 17, Brown teaches the classification comprises a priority number (priority level in Column 36 Line 57).

Regarding claim 8 and 18, Brown teaches the determining step comprises addressing the memory of allocated physical queues in a single cycle (Brown teaches using CAM 1402 and its contents can be searched in one cycle, see instant specification Page 16 Line 16-17).

Regarding claim 9 and 19, Brown teaches updating a memory when a physical queue is de-allocated, wherein the memory indicates whether the classification corresponds to the previously-allocated physical queue (Column 36 Line 61-44, also see Column 27 Line 43-46).

Regarding claim 10, 20 and 21, Brown teaches the network device further comprises a free list that indicates physical queues available for allocation and wherein the method further comprises updating the free list when the previously-allocated physical queue is de-allocated (Column 27 Line 8-31, see also Figure 11C).

Regarding claim 24, Brown teaches the content addressable memory is searchable in one clock cycle (Brown teaches using CAM 1402 and its contents can be searched in one cycle, see instant specification Page 16 Line 16-17).

Regarding claim 25, Brown teaches the memory is a random access memory 1401.

Regarding claim 29, Brown teaches determining a first number of packets that the ingress port of the network device can receive (1024 for example in Column 36 Line 17-24); and allocating a second number of physical queues for the ingress port, wherein the second number is less than or equal to the first number (256 for example in Column 36 Line 25-33).

Regarding claim 31, Brown teaches identifying a category for each packet arriving at the ingress port (Column 24 Line 1-19, also see Figure 11B and "locates an entry .. that has the same destination address and priority level" in Column 36 Line 52-55, see also step 1802 in Figure 18); correlating the category to an existing physical queue (Column 36 Line 55-57); and storing packet information in the existing physical queue (step 1802-step 1806).

Regarding claim 32, Brown teaches identifying a category for each packet arriving at the ingress port (Column 24 Line 1-19, also see Figure 11B and "locates an entry .. that has the same destination address and priority level" in Column 36 Line 52-55, see also step 1802 in Figure 18); and assigning the category to a physical queue, wherein the network device allocates a new physical queue only when there is no existing physical queue for the category ("If there is no entry, i.e., no active VOQ, with the same destination address … creates a new entry" in Column 36 Line 57-61, see also step 1802 in Figure 18).

Regarding claim 33, Brown teaches the packet information comprises control

information selected from a list consisting of destination information, source information,

priority information, payload type information and payload size information (step 1802-

step 1806).

4.   Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brown et

al. in view of Ciancaglini et al. (US Pub. 2005/0089054).

Regarding claim 30, Brown teaches a method of allocating queues in a network

device, the method comprising: receiving a packet at an ingress port 1102 of a network

device, wherein the ingress port has a plurality of virtual queues 1110 (Column 22 Line

31-45); making a classification for the packet according to a virtual queue from said

plurality of virtual queues (Brown teaches classifying based on destination port address

and priority level in Column 24 Line 1-19, also see Figure 11B), the virtual queue 1110

configured to hold a collection of information in a particular order, including information

associated with the packet (Column 22 Line 31-45); determining, by searching a

memory of allocated physical queues, whether a previously- allocated physical queue

exists for the classification ("locates an entry .. that has the same destination address

and priority level" in Column 36 Line 52-55, see also step 1802 in Figure 18); allocating

a physical queue for the classification when no previously-allocated physical queue

exists for the classification ("If there is no entry, i.e., no active VOQ, with the same

destination address … creates a new entry" in Column 36 Line 57-61, see also step

1802 in Figure 18); associating the physical queue with the ingress port (iVOQs 1110 is

associated with iReveiver 1102, see Figure 11A); storing said information associated

with the packet in the allocated physical queue (step 1802-step 1806); and scheduling

the packet for transmission between the ingress port and one of a plurality of egress

ports of the network device (Column 23 Line 30-33, see also Figure 19). Brown also

teaches determining a first number of packets that the ingress port of the network

device can receive (1024 for example in Column 36 Line 17-24); and allocating a

second number of physical queues for the ingress port, wherein the second number is

less than or equal to the first number (256 for example in Column 36 Line 25-33).

Brown, however, does not teach the network device operates according to a Fibre

Channel protocol and wherein the determining step is based on a number of buffer-to-

buffer credits granted by the ingress port. Ciancaglini teaches the network device

operates according to a Fibre Channel protocol [0132] and wherein the determining step

is based on a number of buffer-to-buffer credits granted by the ingress port [0132]. It

would have been obvious to one skilled in the art to modify Brown to be with the

network device operates according to a Fibre Channel protocol and wherein the

determining step is based on a number of buffer-to-buffer credits granted by the ingress

port as taught by Ciancaglini in order to provide efficient and reliable data transport in

storage environment [0011].

Response to Arguments

5.   Applicant's arguments with respect to claims 1, 3-14, 16-25 and 29-33 have been

considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLEMENCE HAN whose telephone number is (571)272-3158. The examiner can normally be reached on Monday-Friday 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (571) 272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Clemence Han/
Examiner, Art Unit 2464